

A gynecological perspective on incisional hernia in patients after hysterectomy for benign vs. malignant indications

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ABSTRACT

Aims: The aim of this study is to compare demographic and perioperative data of patients who developed incisional hernia after hysterectomy at Kocaeli University Medical Faculty and to evaluate potential factors contributing to hernia formation.

Methods: Retrospective data were analyzed for patients who underwent hysterectomy for benign or malignant reasons and later developed incisional hernia at the same hospital. A total of 63 patients, including 27 with malignancy and 36 with benign conditions, were included. Demographic data such as age, body-mass index (BMI), smoking, incision, surgical site infection (SSI), drain, and duration were assessed.

Results: The mean age of the patients was 56.44 ± 9.49 years. No statistically significant differences were found between the two groups regarding age, BMI, comorbidities, smoking, SSI, and drain duration. However, there was a significant difference in the incision, with the Pfannenstiel incision being preferred for benign hysterectomy ($p < 0.0001$). Drain use was significantly more common in malignant cases ($p = 0.002$).

Conclusion: Incisional hernia is one of the most common types of ventral hernia. Incisional hernias are most frequently observed in women, especially following gynecological and obstetric surgeries. In our study, benign cases showed a higher incidence of incisional hernia. Obesity is a significant risk factor for hernia. The average BMI in the study was 31.18 ± 5.22 , with no significant difference between the groups. The lower midline incision was identified as the most risky incision for hernia development, though most of our patients had a Pfannenstiel incision. Despite treatment, incisional hernia developed in many patients with SSI. SSI was present in only 28.6% of those who developed hernia in both groups. Smoking causes tissue hypoxia, and the smoking rate among our patients was 39.7%. Modifiable risk factors can be managed or controlled to prevent hernia development.

Keywords: Benign, malignant, hysterectomy, incisional hernia, body mass index, drain

INTRODUCTION

Ventral (anterior abdominal wall) hernias can develop either spontaneously or as acquired (postoperative). Among these, incisional hernias are the most common, with a prevalence of 43%.¹ In patients who have previously undergone abdominal surgery with any incision, the incidence is between 10-15%.² They typically present as painful or painless swelling on the abdomen. Although they can be asymptomatic, they may present in a reducible, incarcerated, or strangulated state.³ Incisional hernias are most frequently observed in female patients, particularly after gynecological and obstetric surgeries.³ It occurs due to a deficiency in fascial closure, and the development of this condition is influenced by various factors related to both the patient and the surgical technique.⁴ Incisional hernias can be a secondary cause for either elective or emergency surgeries, potentially leading to significant morbidity, mortality, and a reduction in the quality of life,

often associated with a degree of work loss. In this study, we aimed to compare demographic and perioperative data in patients who developed incisional hernias after hysterectomy and assess the factors that may contribute to the development of hernias.

METHODS

The study was conducted with the permission of Kocaeli University Non-interventional Clinical Researches Ethics Committee (Date: 11.06.2024, Decision No: 2024-146). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Patients who underwent hysterectomy for benign or malignant reasons and later developed incisional hernias, diagnosed and operated on at the same hospital, were

retrospectively reviewed at Kocaeli University Faculty of Medicine, Department of Obstetrics and Gynecology between 2018 and 2024. A total of 27 patients with malignant diagnoses and 36 with benign diagnoses, who met the criteria within a 7-year period, were included in the study. Two separate groups were created to assess any differences in the incidence of incisional hernia between the two diagnostic groups. Data were collected regarding age, body-mass index (BMI), comorbidities such as diabetes mellitus (DM), hypertension (HT), thyroid disorders, chronic obstructive pulmonary disease (COPD), smoking history, type of incision, development of SSI, drainage use, and duration of drainage. Comparisons were made between the two groups. Laparoscopic cases were excluded, as only two patients met the criteria.

Statistical Analysis

The data analysis was performed using IBM SPSS 29.0 (IBM Corp., Armonk, NY, USA). The normality of the data was assessed with the Shapiro-Wilk and Kolmogorov-Smirnov tests. Continuous variables were expressed as mean±standard deviation, while categorical variables were presented as frequencies and percentages. Independent t-tests were used for comparisons between groups, and Chi-square analysis was used for determining relationships between categorical variables. A p-value of <0.05 was considered statistically significant.

RESULTS

The demographic and perioperative data of all patients are shown in **Table 1**. The mean age of the patients was 56.44±9.493 years, and the mean BMI was 31.182±5.221. Among the malignant diagnoses, endometrial cancer, ovarian cancer, cervical cancer, and sarcoma were identified, while benign diagnoses included leiomyoma, treatment-resistant abnormal uterine bleeding, and endometrial hyperplasias. A total of 31 (49.2%) patients had drainage, and the majority of those who developed incisional hernias (74.2%) had drainage for 1-3 days.

The comparison between patients with benign and malignant diagnoses is shown in **Table 2**. There were no statistically significant differences between the two groups in terms of age, BMI, comorbidities, smoking history, or SSI. The number of drainage days in the benign group was only 1-3 days, so statistical significance could not be assessed. However, regarding the incision type, there was a significant difference between the two groups, with a higher frequency of Pfannenstiel incisions in the benign group ($p<0.0001$). The presence of drainage was significantly more common in the malignant group ($p=0.002$).

DISCUSSION

Risk factors for the development of incisional hernias include advanced age, obesity, smoking, nutritional deficiencies, immunosuppressive therapy, and collagen disorders. Even with optimal suture techniques, poor wound healing in these cases can increase the risk of hernia formation.⁵ Obesity is a significant risk factor for the formation, recurrence, and complications (e.g., strangulation) of hernias.⁶ Studies have shown that the average BMI of patients with incisional hernias is 33 kg/m².^{7,8} In this study, the average BMI was

Table 1. Demographic and perioperative data of all patients

Study population (n=63)	
Age, mean±SD	56.44±9.493
BMI, mean±SD	31.182±5.221
Pathology, n (%)	
Benign	36 (57.1)
Malign	27 (42.9)
Malignant diagnoses, n (%)	
Endometrium cancer	11 (17.5)
Ovary cancer	12 (19)
Cervix cancer	2 (3.2)
Sarcoma	2 (3.2)
Benign diagnoses, n (%)	36 (57.1)
Comorbidities, n (%)	
DM	15 (23.8)
HT	29 (46)
Thyroid disorders	13 (20.6)
COPD	9 (14.3)
Smoking, n (%)	25 (39.7)
Drain use, n (%)	31 (49.2)
Drain length of stay, n (%)	
1.-3. day	23 (74.2)
4.-7. day	7 (22.6)
8.-14. day	1 (3.2)
SSI, n (%)	18 (28.6)

SD: Standard deviation, BMI: Body-mass index, DM: Diabetes mellitus, HT: Hypertension, COPD: Chronic obstructive pulmonary disease, SSI: Surgical site infection

Table 2. Comparison of demographic and perioperative data of patients between the two groups

	Benign group (n=36)	Malign group (n=27)	P
Age, mean±SD	55.11 ±10.474	58.22 ±7.841	0.200
BMI, mean±SD	30.599 ±4.282	31.958 ±6.263	0.310
Incision, n (%)			
Pfannenstiel	26 (72.2)	1 (3.7)	<0.0001
Lower midline	10 (27.8)	5 (18.5)	
Midline	0	21 (77.8)	
Comorbidities, n (%)			
DM	9 (25)	6 (22.2)	1.000
HT	16 (44.4)	13 (48.1)	0.971
Thyroid disorders	6 (16.7)	7 (25.9)	0.559
COPD	4 (11.1)	5 (18.5)	0.480
Smoking, n (%)	14 (38.9)	11 (40.7)	1.000
Drain use, n (%)	11 (35.5)	20 (64.5)	0.002
Drain length of stay, n (%)			
1.-3. day	11 (100)	12 (60)	NA
4.-7. day	0	7 (35)	
8.-14. day	0	1 (5)	
SSI, n (%)	9 (25)	9 (33.3)	0.658

SD: Standard deviation, BMI: Body-mass index, DM: Diabetes mellitus, HT: Hypertension, COPD: Chronic obstructive pulmonary disease, SSI: Surgical site infection, $p<0.05$

31.18±5.22, with no significant difference between the two groups in terms of BMI. Given that hysterectomy patients tend to be older, age is an important factor, but there was no significant difference between the two groups in this regard.

When examining comorbidities, a study reported that 46 patients (35.9%) had no comorbidities, while 49 (38.2%) had COPD, and 25 (19.5%) had DM.⁹ In our study, the most common comorbidity was HT (46%), followed by DM, thyroid disorders, and COPD. There was no significant difference between the groups in terms of comorbidities. Smoking has been shown to cause peripheral tissue hypoxia, which, in turn, disrupts the synthesis of collagen types I and III, and leads to connective tissue abnormalities.¹⁰ The smoking rate among our patients was 39.7%, but no significant difference was observed between the two groups.

Technical factors related to abdominal surgery can also predispose to the formation of incisional hernias. Excessive tension during fascial closure, the inability to achieve a suture-to-wound length ratio of $>4:1$, and improper suture techniques can contribute to the development of hernias.¹¹ Vertical incisions have a higher risk for hernia formation than transverse or oblique incisions, and incisional hernias are most commonly observed after upper abdominal incisions among vertical incisions.¹² In female patients, the midline vertical incision is the most at-risk incision for hernia formation.³ In the benign group, the absence of the lower midline incision and the predominance of Pfannenstiel incision led to a statistically significant difference ($p<0.0001$).

However, among all hysterectomy patients, the most common incision type was Pfannenstiel. In patients with incisional hernias, the sequence of incision types were most commonly the lower midline vertical incision, followed by the midline incision. The results obtained were not consistent with the literature regarding the type of incision.

Wound infections can disrupt normal wound healing.¹³ In many patients who developed SSI, incisional hernias were observed despite additional interventions or medical treatments.⁹ Only 28.6% of the patients who developed hernias had a postoperative SSI. There was no significant difference between benign and malignant patients regarding SSI rates.

Limitations

A limitation of the study is that the patients included were selected solely from those who underwent hernia surgery at our hospital. It is believed that the actual number of cases is higher, and the distribution of the included patients does not reflect the correct representation.

CONCLUSION

In patients who underwent hysterectomy, no statistically significant difference was found in the formation of incisional hernias between malignant and benign diagnoses. If modifiable risk factors can be eliminated or controlled, the development of hernias can be prevented, or at least patients can be managed more carefully during the perioperative period. Recommendations include the use of appropriate fascial closure techniques and the selection of the correct incision type, tailored to the patient's risk factors and the clinical context.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was conducted with the permission of Kocaeli University Non-interventional Clinical Researches Ethics Committee (Date: 11.06.2024, Decision No: 2024-146).

Informed Consent

Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

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Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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